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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/27/2005

Helmuth Holler

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EXAMINER

MA, JAMESON Q

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/554,700	Applicant(s) HOLLER ET AL.	
	Examiner JAMESON Q. MA	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-4 and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tetsuo et al. (from IDS, JP 57054832) in view of Hirota et al. (US 3,664,965) and Ueda et al. (US 2002/0012767).

Regarding claim 1, Tetsuo discloses a method for leak-testing a component having cavities (test piece 4), comprising, on at least one side of the component to be tested, completely wetting with a testing liquid at least an area to be tested (see Abstract: the entire test piece is submerged in a fluid to test for leaks), subjecting the component to a temperature increase (see abstract), checking the component test area for a bubble formation of the testing liquid (see abstract).

While Tetsuo discloses the test piece covered by a testing liquid to detect leaks by bubble formation, the reference does not explicitly disclose the testing liquid being foam-forming.

Hirota '965 discloses applying a foam-forming composition to a structure (see C1/L13-20). Hirota '965 further discloses that the composition is externally applied to structures in leak detection testing, and that bubbles of sufficient durability are formed to cling to the point of origin, allowing inspection to occur a considerable time after testing (see C1/L49-54).

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute for the testing liquid used in the method of Tetsuo, a film of the foam-forming liquid as taught by Hirota '965, in order to allow leak origins to precisely defined and remain visible for extended time periods.

Modified Tetsuo discloses all of the claim limitations as set forth above. The reference fails to disclose that the test piece is made of a composite material consisting of at least one cover layer and a construction core, having a plurality of cavities.

Ueda discloses honeycomb sandwich panels containing cells that are hermetically sealed (see [0005]).

Since Tetsuo is directed to the testing of generic test pieces for airtightness (hermeticity), it would have been obvious to one of ordinary skill in the art to select the honeycomb sandwich panel of Ueda to test for airtightness because doing so would have resulted in nothing more than the simple substitution of hermetically sealed components with a reasonable expectation of success.

Regarding claim 2, modified Tetsuo discloses all of the claim limitations as set forth above. Additionally the reference discloses that the internal pressure of an inspected test piece is raised by raising the temperature of the test piece. This step aids in the formation of bubbles through defective points. This heating step is effectively creating a pressure differential between the test piece interior cavity and the environment. The reference does not explicitly disclose a step of cooling the component before applying the test liquid. However, it is well known in the art the cooling a component will decrease the internal pressure of a cavity.

It would have been obvious to one of ordinary skill in the art at the time of invention to additionally cool the test piece of modified Tetsuo before heating in order to create an even larger pressure differential, which would allow easier formation of bubbles through defective points in the test piece.

Regarding claim 3, not specifically taught is a method, characterized in that the cooling is effected to -30°C at the most. However, the routine experimental modification of this prior art done in order to ascertain the optimum properties of disclosed leak detection fails to render the applicant's claims patentable in the absence of unexpected results. See *In re Aller*, 105 USPQ 233 and MPEP 2144.05. At the time of invention a person having ordinary skill in the art would have found it obvious to optimize the temperature to which to cool the component in order to balance such properties as cost and possible damage to components due to cooling at excessive temperatures. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. See *In re Boesch and Slaney*, 205 USPQ 215.

Regarding claims 4 and 7, modified Tetsuo discloses all of the claim limitations as set forth above. Additionally, Tetsuo discloses the method wherein at least the component test area is heated after having been wetted with the testing liquid (see Abstract). Tetsuo also teaches the method wherein opposed portions of the component area to be tested are wetted with the testing liquid (see Abstract: the entire test piece is wetted with the testing liquid).

Regarding claim 6, not specifically taught is a method, characterized in that the heating is effected to 80°C at the most. However, the routine experimental modification of this prior art done in order to ascertain the optimum properties of disclosed leak detection fails to render the applicant's claims patentable in the absence of unexpected results. See *In re Aller*, 105 USPQ 233 and MPEP 2144.05. At the time of invention a person having ordinary skill in the art would have found it obvious to optimize the temperature to which to heat the component in order to balance such properties as cost and possible damage to components due to heating at excessive temperatures. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. See *In re Boesch and Slaney*, 205 USPQ 215.

Regarding claims 8-10, modified Tetsuo discloses all of the claim limitations as set forth above. Additionally, Hirota '965 teaches the method:

- wherein sites exhibiting bubble formation are marked (see C3/L1-3).
- wherein the testing liquid is applied by brushing at least the component area to be tested (see C2/L65).
- wherein the testing liquid is applied by spraying at least the component area to be tested (see C2/L65).

3. Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tetsuo et al. (from IDS, JP 57054832) in view of Hirota et al. (US 3,664,965) and Ueda et al. (US 2002/0012767) as applied to claims 1-4 and 6-10 above, and further in view of Goldfarb et al. (US 4,553,435).

Regarding claims 5 and 14, modified Tetsuo discloses all of the claim limitations as set forth above. While modified Tetsuo discloses that the component (test piece) is heated by a heater, the reference does not explicitly disclose the method wherein the component is heated by irradiation or infrared irradiation.

Goldfarb teaches an infrared heating lamp (see fig. 1: infrared lamp 31) used to heat components.

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute for the heater in the method of modified Tetsuo, an infrared heat lamp as taught by Goldfarb, because doing so would have resulted in nothing more than the simple substitution of known heating elements to obtain predictable results.

4. Claims 11-13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tetsuo et al. (from IDS, JP 57054832) in view of Hirota et al. (US 3,664,965) and Ueda et al. (US 2002/0012767) as applied to claims 1-4 and 6-10 above, and further in view of Hirota et al. (4,113,673).

Regarding claims 11-13, modified Hirota '965, discloses all of the claim limitations as set forth above. Modified Hirota '965 does not explicitly disclose a method:

- further comprising after said testing, a step of removing the testing liquid by washing.
- wherein the washing process step is effected under pressure.
- characterized in that the washing process is mechanically assisted.
- wherein the washing step is mechanically assisted.

Hirota '673 discloses a method for leak-testing a component by applying a bubble forming substance to a test area (C5/L3-5). Hirota '673 further discloses removing the test liquid by washing with water at a pressure of 2kg/cm^2 (C5/L65-67). In order to pressurize the water, this process must have inherently been mechanically assisted.

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate the washing methods of modified Hirota '965, as taught by Hirota '673, in order to prevent the test liquid from interfering with normal operation/use of the component.

5. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tetsuo et al. (from IDS, JP 57054832) in view of Hirota et al. (US 3,664,965), Ueda et al. (US 2002/0012767), and Goldfarb et al. (US 4,553,435).

Regarding claim 16, Tetsuo discloses a method for leak-testing a component having cavities (test piece 4), comprising, on at least one side of the component to be tested, completely wetting with a testing liquid at least an area to be tested (see Abstract: the entire test piece is submerged in a fluid to test for leaks), subjecting the component to a temperature increase (see abstract), checking the component test area for a bubble formation of the testing liquid (see abstract).

While Tetsuo discloses the test piece covered by a testing liquid to detect leaks by bubble formation, the reference does not explicitly disclose the testing liquid being foam-forming.

Hirota '965 discloses applying a foam-forming composition to a structure (see C1/L13-20). Hirota '965 further discloses that the composition is externally applied to structures in leak detection testing, and that bubbles of sufficient durability are formed to cling to the point of origin, allowing inspection to occur a considerable time after testing (see C1/L49-54).

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute for the testing liquid used in the method of Tetsuo, a film of the foam-forming liquid as taught by Hirota '965, in order to allow leak origins to precisely defined and remain visible for extended time periods.

Modified Tetsuo discloses all of the claim limitations as set forth above. The reference fails to disclose that the test piece is made of a composite material consisting of at least one cover layer and a construction core, having a plurality of cavities.

Ueda discloses honeycomb sandwich panels containing cells that are hermetically sealed (see [0005]).

Since Tetsuo is directed to the testing of generic test pieces for airtightness (hermeticity), it would have been obvious to one of ordinary skill in the art to select the honeycomb sandwich panel of Ueda to test for airtightness because doing so would have resulted in nothing more than the simple substitution of hermetically sealed components with a reasonable expectation of success.

While modified Tetsuo discloses that the component (test piece) is heated by a heater, the reference does not explicitly disclose the method wherein the component is heated by irradiation or infrared irradiation.

Goldfarb teaches an infrared heating lamp (see fig. 1: infrared lamp 31) used to heat components.

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute for the heater in the method of modified Tetsuo, an infrared heat lamp as taught by Goldfarb, because doing so would have resulted in nothing more than the simple substitution of known heating elements to obtain predictable results.

For claim 17, Ueda discloses that the cover layer is a carbon fiber fabric (see [0006]) and the core is configured as a lightweight honeycomb of the plurality of cavities.

Response to Arguments

6. Applicant's arguments, see pages 7-9 of the response, filed 5/4/2009, with respect to the rejection based on the combination of Disclosed Art and Hirota '965 have been fully considered and are persuasive.

7. Applicant's remaining arguments filed 5/4/2009 have been fully considered but they are not persuasive. Applicant asserts that Tetsuo discloses an immersion method which concerns a fundamentally different technique than that of the claims and that the reference cannot be combined with Hirota '965 to lead to the claimed invention. In response, the examiner notes that the Tetsuo reference is used as a base teaching for using heat to increase the internal pressure of an item that is being checked for leaks. Similarly to the Hirota reference, the test piece is surrounded by a test fluid to check for bubble formation. The references are thus still seen to be properly combined as the

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foam-forming liquid of Hirota '965 would allow for more visible and resilient bubble formation.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMESON Q. MA whose telephone number is (571)270-7063. The examiner can normally be reached on M-R 8:30 AM - 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JM

/Jill Warden/
Supervisory Patent Examiner, Art Unit 1797

July 16, 2009